

UPS DEVICES

INTRODUCTION

Today's PCs are very stable, and even if an application crashes, it shouldn't cause you to lose work in any other applications you have open. If you have a desktop PC, though, there's still one event that can damage your files and even Windows itself: a power cut.

Computers need to shut down properly, so a sudden loss of power can damage files on your hard disk. Fortunately, you can protect against this danger. An uninterruptible power supply (UPS) sits between your PC and the mains. In the event of a power cut, its battery keeps your PC running, giving you time to shut it down safely. UPS devices can also protect your PC against power surges or brownouts, monitoring the power that enters your PC and adjusting it as necessary.

We've tested eight of the latest UPS devices, putting each through its paces to see how long it can keep your PC going when the power fails. We'll find a UPS that will save your work and your money.

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KEEP ON RUNNING

A power cut or surge can spell doom for your PC and all your data. We test eight UPS devices to find the best defence against mains mayhem

Choosing a... UPS Device

There are several factors to consider when choosing a UPS. You need to take into account how much power it needs to supply, and how many different pieces of equipment you want it to keep running in the event of a power cut. You should also consider whether you'll always be near enough to your PC to save your work before the battery runs out, or if you need the UPS to do this for you. This guide will help you find the perfect way to safeguard your work when the lights go out.

POWER UP

There's no point in having a UPS unless it can reliably power your PC and monitor. For this reason you should consider carefully how much power you need your new UPS to supply. The amount of power your PC requires, measured in watts, depends on the components inside. Your UPS should be able to supply this amount of power, plus a safety margin of around 40 per cent.

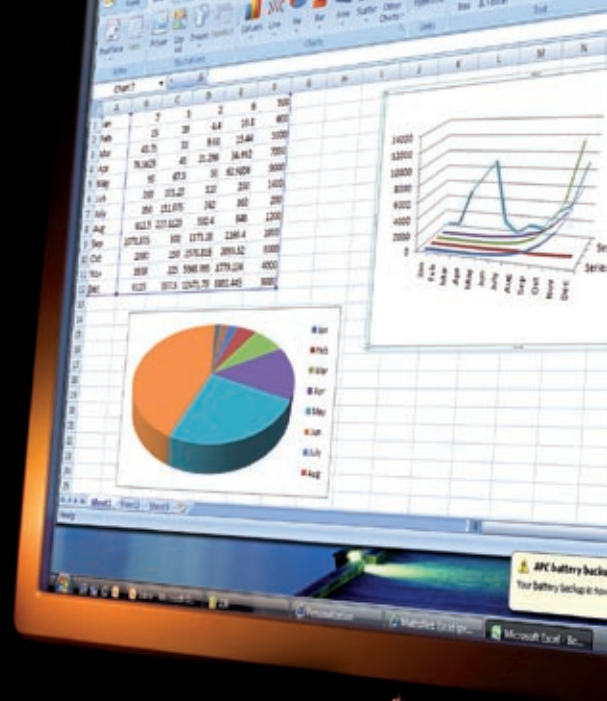
UPS manufacturers state maximum power outputs in volt amps, or VA, and also in watts. Annoyingly, this watts rating is often hidden away in the product manual and not quoted in product specifications or on the box. As volts x amps = watts, you would expect the figures to be the same. However, this is not the case

when powering PC equipment. PC power supplies draw two kinds of power from the mains: consumed power and reactive power. Consumed power is used by the PC's components, while reactive power is stored in magnetic coils and returned to the mains. When a UPS is powering your PC from its battery it has to provide both types of power, which puts more of a strain on the battery. For this reason, the amount of watts of power a UPS can provide is lower than its VA rating. We've listed the number of watts each model can provide in our table on page 114.

The easiest way to find out how many watts your PC requires is to use a power meter, available for £27 from Maplin: see <http://tinyurl.com/2ccf8y>. Add together the number of watts drawn by your computer, your monitor and anything else you want to connect to the UPS, then add 40 per cent to see how much power your UPS should be able to provide. If you don't want to buy a power meter, we've listed the power requirements of a typical low-, medium- and high-specification PC in the box on the opposite page.

SOCKET TO 'EM

Another important consideration is the number of power sockets your UPS needs. Three of the





This month

TRUST
600VA UPS

Page 110

TRUST
950VA UPS

Page 110

APC
Back-UPS CS 350VA

Page 110

APC
Back-UPS ES 700VA

Page 110

BELKIN
800VA Universal UPS

Page 113

TRUST
1200VA
Management UPS

Page 113

BELKIN
1200VA Universal UPS

Page 113

APC
Back-UPS RS 800VA

Page 113



UPS devices in the group use standard UK three-pin sockets, so it's easy to connect any equipment with a standard plug. The remaining five units use female IEC, or kettle, sockets and come with female-to-male IEC cables. These are fine for powering your PC and monitor, but they won't enable you to connect many printers or other peripherals.

Besides the power sockets, which provide both battery power and surge protection, many UPS devices have additional sockets that provide only surge protection. Many UPS units also have RJ-11 and RJ-45 telephone and Ethernet plugs, which enable you to protect equipment such as broadband routers or telephones from surges coming down the phone line, and protect your PC from any power spikes that pass through your home network.

All the manufacturers in the group offer financial compensation if any equipment connected to the UPS is damaged by a power surge. The amount of compensation on offer varies from £12,000 to £200,000 for the top-of-the-range Belkin 1200VA Universal UPS.

As well as power surges, a UPS can also protect against dips in the mains voltage, or brownouts. If the mains voltage gets too low, your PC may crash, so a UPS will attempt to compensate by adding power. The way it compensates depends on whether the unit is a standby UPS, or line-interactive. A standby UPS

doesn't provide any battery power until the voltage drops below an acceptable level, and will then switch straight to battery power. A line-interactive UPS will attempt to use its battery to boost the mains voltage to an acceptable level, and will switch entirely to battery power only when it can no longer provide a large enough boost. This voltage boost technology is known as Automatic Voltage Regulation (AVR). Thanks to AVR, a line-interactive UPS will tolerate much lower voltages than a standby UPS, and will switch to battery power less often, prolonging the life of the battery.

STAY ALERT

When the power goes out and the UPS switches to battery power, it will beep intermittently to warn you that you need to shut down your

computer. This is fine if you're within earshot of the device and can get to the PC in time to save your work, but if you're not around, it's less helpful. Six of the UPS units solve this problem by connecting to your PC, which enables them to shut down the PC automatically if the battery level falls too low. They can even save any open files before turning off the computer, safeguarding your work. Some can even send an email alert, warning you or an administrator that your computer is shutting down.

Five of the UPS units in the group connect to your PC with a USB cable, but Trust's 1200VA Management UPS uses a serial cable. Some modern PCs lack a serial port, or the port may be disabled in the BIOS. If you're thinking of buying the Trust 1200VA UPS, check that your serial port is present and working correctly.

TYPICAL PC POWER REQUIREMENTS (WATTS)

PC TYPE	HIGH-SPECIFICATION	MEDIUM-SPECIFICATION	LOW-SPECIFICATION
Processor	Intel Core 2 Extreme QX6700	AMD Athlon X2 3800+	Intel Pentium 4 2.53GHz
Graphics card	ATI Radeon HD 2900XT	Nvidia GeForce 7600GT	ATI Radeon 9800 Pro
PSU rated wattage	600W	400W	250W
Monitor	20in widescreen LCD	20in widescreen LCD	20in widescreen LCD
Total power idle	197W	140W	115W
Total power load	356W	198W	163W

▲ Take the total power load of the specification that best matches your PC and add 40 per cent



TRUST 600VA UPS

★★★★★

£30 inc VAT



Trust's 600VA UPS is light on features, but it's by far the cheapest UPS in the group. It's compact and fairly light compared with the rest of the units. It has only one status light that tells you when the UPS is on, but not whether it's running on battery or mains power.

The 600VA has two UPS sockets and one surge-protection socket on the rear. These are IEC or kettle-type sockets, and the UPS comes with two female-to-male IEC leads to power your PC and monitor. The UPS is rated at 600VA, and will be able to power a mid-range PC that draws around 300W from the mains. The RJ-11 phone socket on the rear can protect your phone, ADSL router or modem from power surges.

When we cut the power the 600VA switched to battery and our PC remained stable, even under load. The UPS beeps intermittently when using battery power, and when power is critical the beeping becomes more frequent. There's no way to turn the beeping off, though. The UPS ran for 15 minutes and two seconds when the PC was idle, but just six minutes and 37 seconds with the PC under load. Both times are the shortest in the group. The 600VA doesn't have a PC connection, so it can't save your files or shut down your computer automatically when the power fails. If you can't hear the UPS beeping and shut down your PC manually, you could lose your work.

Trust's 600VA UPS is very cheap and should have enough battery life for most people, as long as you don't stray too far from your PC. It's a simple and inexpensive UPS.

SUMMARY

- ✓ Staggeringly low price
- ✓ Compact and light
- ✗ Short battery life

LINE-INTERACTIVE UPS Two UPS sockets, one surge-only socket, modem protection
PART CODE PW-4060T
SUPPLIER www.lambda-tek.com
DETAILS www.trust.com

TRUST 950VA UPS

★★★★★

£45 inc VAT



Trust's 950VA UPS is almost identical to the 600VA version, but it can work with more demanding PCs that require up to 480W of power. It's a little heavier than the 600VA UPS but still not as back-breaking as Belkin's 800VA UPS.

As with the cheaper 600VA, the 950VA comes with few extras to speak of. It has two IEC UPS sockets, one surge-protection socket and an RJ-11 socket that will protect your phone or ADSL equipment from voltage spikes. Two female-to-male IEC cables are included in the box, so you can connect your PC and monitor straight away. Like the 600VA, the 950VA comes with a WinPower software CD, but as there's no PC connection the software is pointless. The unit has no status lights apart from the power light, but as the UPS beeps continuously while running on battery power, you don't really need a power status LED.

The 950VA UPS ran for a reasonable 22 minutes and one second while the PC was idle, but under load it could manage only nine minutes and eight seconds, putting it near the bottom of the group. As there's no way of connecting the UPS to your PC, it can't save files and shut down your computer automatically. If you leave your PC with unsaved work open, you'll have to rush back and save your files if the power fails.

Trust's 950VA UPS is a reasonable choice if you have a fairly power-hungry PC and you want a large battery to keep it going. We'd recommend spending a little more for the advanced software features and flexible plug layout of APC's Back-UPS ES 700VA, however.

SUMMARY

- ✓ Fairly high power rating
- ✓ Very low price
- ✗ No PC connection

LINE-INTERACTIVE UPS Two UPS sockets, one surge-only socket, modem protection
PART CODE PW-4095T
SUPPLIER www.lambda-tek.com
DETAILS www.trust.com

APC Back-UPS CS 350VA

★★★★★

£55 inc VAT



APC's Back-UPS CS 350VA is more compact and lighter than the other UPS units on test. It has the lowest rated power output in the group at just 350VA. This means it will power a PC and monitor only if their total requirement is less than 210W, so powering a quad-core gaming PC is out of the question. It has three IEC UPS sockets and an IEC surge protection socket. Two IEC cables are included in the box.

The Back-UPS 350VA is a standby UPS, so it will switch to battery power more readily than a line-interactive UPS, which has circuitry to boost the mains voltage. It kept our test PC going for 16 minutes and one second on battery power, which was slightly longer than Trust's 600VA UPS. Considering the small battery it lasted for an impressive period of time when the PC was under load, running for over nine minutes.

The Back-UPS 350VA connects to your PC with a USB cable, and comes with APC's PowerChute software. This is very easy to use and integrates with Windows XP and Vista. You can specify what your PC should do when running on the UPS's battery, such as turning off the monitor or going into Hibernation mode. The software can also save your files and shut down Windows in the event of a power failure, and provides a battery charge readout and wattage load display.

APC's Back-UPS CS 350VA comes with excellent software, but it can't provide enough power for most mid-range PCs. The more powerful ES 700VA is better value.

SUMMARY

- ✓ Easy-to-use software
- ✓ Compact and light
- ✗ Low output; short battery life

STANDBY UPS Three UPS sockets, one surge-only socket, Windows shutdown, Windows file save, modem protection
PART CODE BK350EI
SUPPLIER www.morecomputers.co.uk
DETAILS www.apc.com

APC Back-UPS ES 700VA

★★★★★

£67 inc VAT



While APC's other products have been designed for small businesses, the Back-UPS ES 700VA is ideal for home use. It is designed to replace the multi-plug adaptor you may already use to plug in your PC equipment. It has four battery backup sockets and four surge-protection sockets, all of which are the UK three-pin type. These make the ES 700VA larger than the other UPS units here, but it can power just about any appliance. It also has sockets to protect your phone line and handset against surges, but no Ethernet protection.

The ES 700VA is rated at 700VA and has a maximum output of 405W, which is enough for a medium-specification PC. The battery has a fair capacity, lasting just over 27 minutes with the PC idle and 13 minutes and 22 seconds under load. The UPS connects to your PC with a USB cable, and the supplied PowerChute software can save your files and shut down the PC if the power goes out. It also unlocks the Windows battery-specific power options, so you can fine-tune your PC's behaviour when the UPS is supplying battery power. It shows the remaining battery charge and how much power your PC draws, so you can avoid overloading the UPS.

APC's ES 700VA can't match Belkin's 800VA Universal UPS for battery capacity, but it has more sockets and is cheaper and easy to use. It's an excellent buy.

SUMMARY

- ✓ Easy-to-use software
- ✓ Lots of standard sockets
- ✗ Average battery life

STANDBY UPS Four UPS sockets, four surge-only sockets, Windows shutdown, Windows file save, modem protection
PART CODE BE-700-UK
SUPPLIER www.kikatek.com
DETAILS www.apc.com

BELKIN 800VA Universal UPS

★★★★★

£88 inc VAT



Belkin's 800VA Universal UPS can supply up to 450W, so it's powerful enough to run a fairly high-specification PC. Like APC's ES 700VA, Belkin's UPS units have standard UK three-pin sockets rather than kettle-style IEC sockets. This makes it easy to connect other devices, such as a printer or broadband router, and keep them running if the power fails. It has three UPS sockets and a surge-only socket.

The 800VA kept our PC going long after we pulled out the plug. The battery kept our idle PC running for 40 minutes, which gives you plenty of time to return and save your work. It also ran for 28 minutes with the PC under load. Strangely, it lasted longer under load than the higher-rated Belkin 1200VA, even though its idle performance was not as good.

The Belkin 800VA can connect to your PC with either a USB or a serial cable. The supplied Bulldog Plus software looks ancient and is confusing at first, but it is powerful. It doesn't integrate with Windows as APC's PowerChute package does, but it can shut down or hibernate your PC after a certain amount of time on battery power, and can save your open files. Unlike the APC software, Bulldog Plus can even notify you by email when the UPS is running on battery power. For this to work, you need to install it with the Networking option enabled.

Belkin's 800VA UPS has plenty of battery capacity and powerful, if rather confusing, software. If you can manage with a slightly lower power output and don't need email alerts, APC's ES 700VA is cheaper, simpler and has more UPS and surge-protection sockets.

SUMMARY

- ✓ Long battery life
- ✓ Standard sockets; email alerts
- ✗ Software is confusing

LINE-INTERACTIVE UPS Three UPS sockets, one surge-only socket, Windows shutdown, Windows file save, modem protection, Ethernet protection
PART CODE F6C800ukUNV
SUPPLIER www.morecomputers.co.uk
DETAILS www.belkin.com/uk

TRUST 1200VA Management UPS

★★★★★

£89 inc VAT



Trust's 1200VA Management UPS is the largest in the group. Like Belkin's 1200VA Universal UPS it has a rated output of 1200VA, but it provides a maximum power output of 600W. It is aimed at business users, so it uses IEC rather than standard three-pin sockets. You could use the UPS to keep two PCs and monitors running during a power cut, but with only two cables included you would need to buy some extras.

The 1200VA UPS has a reasonable battery life. The battery kept the PC running for 37 minutes and two seconds when idle, and for 26 minutes and 31 seconds under load. Both these times are slightly lower than those of the cheaper 800VA Belkin model.

The 1200VA UPS comes with the same WinPower power-management software as the cheaper Trust models, but unlike those it has a PC connection. This uses a serial cable rather than USB, so you'll need to make sure your PC has a serial port, and that it is enabled in the BIOS. We had to download the latest version of the software to make it work, but even this looks as if it was written for Windows 95. The software monitors voltages, battery power and load on the UPS, and will save files and shut down Windows after a certain amount of time on battery power. It can also send an email notification, but this didn't always work. Trust's 1200VA Management UPS is good value for such a high-power UPS, but its software is poor and the 800VA Belkin model ran for longer in our tests.

SUMMARY

- ✓ High power rating
- ✗ Serial cable PC connection
- ✗ Confusing software

LINE INTERACTIVE UPS Four UPS sockets, Windows shutdown, Windows file save, modem protection
PART CODE PW-4120M
SUPPLIER www.lambda-tek.com
DETAILS www.trust.com

BELKIN 1200VA Universal UPS

★★★★★

£105 inc VAT



The 1200VA Universal UPS is like the 800VA version but with a much higher capacity. Its battery can support a power-hungry 670W PC, so it's ideal for a gaming PC with a huge power supply and high-end graphics. It has three standard three-pin UK sockets for battery backup and one for surge protection, so it's more convenient for home users than models that use IEC plug sockets. You can protect your phone line and network with the integrated RJ-11 and RJ-45 sockets, and your equipment is guaranteed against power surge damage for up to £200,000.

The 1200VA's battery life when powering an idle PC is superb: at 49 minutes and three seconds, it fell just short of the APC RS 800VA's 51 minutes. Its battery life under load was less impressive. At 22 minutes and 56 seconds, the unit failed sooner than the cheaper 800VA Belkin UPS.

The 1200VA comes with the same software as Belkin's 800VA. This has an unfriendly interface and is fairly tricky to set up, but it has more features than APC's PowerChute and can notify you by email when the UPS switches to battery power. It also shows you the UPS battery's current charge and load.

Belkin's 1200VA Universal UPS can support very powerful PCs and, although it performed fairly poorly under load, it enables you to shut down your gaming PC if a power cut occurs. It's a good choice for owners of powerful PCs. Unless you need more than 405W, though, the APC Back-UPS ES 700VA is cheaper and easier to use.

SUMMARY

- ✓ High power rating
- ✓ Standard sockets; email alerts
- ✗ Confusing software

LINE-INTERACTIVE UPS Three UPS sockets, one surge-only socket, Windows shutdown, Windows file save, modem protection, Ethernet protection
PART CODE F6C120ukUNV
SUPPLIER www.dabs.com
DETAILS www.belkin.com/uk

APC Back-UPS RS 800VA

★★★★★

£122 inc VAT



The Back-UPS RS 800VA comes from APC's business range. It has plenty of UPS sockets and a long battery life, but is also expensive. While Belkin's 800VA-rated UPS delivers only 450W, APC's RS 800VA can power a 540W PC. The rear of the unit has four UPS sockets and one surge protection socket. These are all of the female IEC kettle-plug type. Like Trust's 1200VA Management UPS, the RS 800VA comes with just two female-to-male IEC cables. If you want to take advantage of all the sockets and power two computers, you'll need to buy extra cables. These cost around £3 from www.disking.co.uk.

The RS 800VA has a superb battery life. It kept our idle test PC running for over 51 minutes, and managed to power it for nearly 33 minutes during intensive use. Both results are the best in the group.

The supplied PowerChute Personal software is easy to use. Monitoring the UPS's battery charge and load status is a simple task, as is setting what the UPS should do when the power goes out or the battery is running low. The software lacks some of the advanced features you'll find in Trust's WinPower or Belkin's Bulldog Plus, though, and it seems a shame that APC didn't include the more powerful PowerChute Business edition with this fairly expensive device.

If you need a UPS for a fairly powerful PC and want it to last for as long as possible, the RS 800 is a good choice. It is expensive, though, and you can buy a cheaper unit that provides more power.

SUMMARY

- ✓ Long battery life; high power
- ✓ Easy-to-use software
- ✗ Expensive

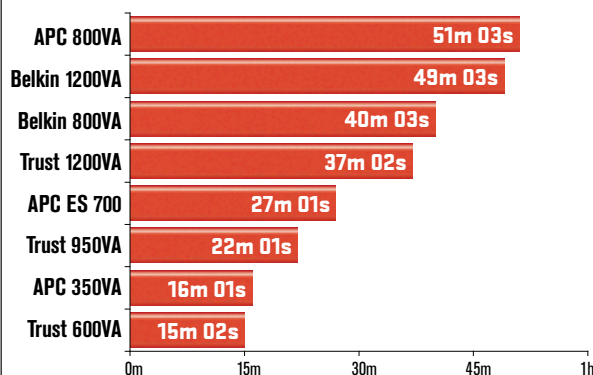
LINE-INTERACTIVE UPS Four UPS sockets, two surge-only sockets, Windows shutdown, Windows file save, modem protection, Ethernet protection
PART CODE BR800I
SUPPLIER www.dabs.com
DETAILS www.apc.com

UPS DEVICES

	BUDGET BUY			BEST BUY				
MANUFACTURER	TRUST	TRUST	APC	APC	BELKIN	TRUST	BELKIN	APC
MODEL	600VA UPS	950VA UPS	Back-UPS CS 350VA	Back-UPS ES 700VA	800VA Universal UPS	1200VA Management UPS	1200VA Universal UPS	Back-UPS RS 800VA
Rating	★★★★	★★★	★★★	★★★★★	★★★★	★★★	★★★★	★★★
SPECIFICATIONS								
VA rating	600VA	950VA	350VA	700VA	800VA	1,200VA	1,200VA	800VA
Watts rating	300W	480W	210W	405W	450W	600W	670W	540W
Type	Line interactive	Line interactive	Standby	Standby	Line interactive	Line interactive	Line interactive	Line interactive
Sine wave	Stepped	Stepped	Stepped	Stepped	Stepped	Stepped	Stepped	Stepped
FEATURES								
Socket type	IEC	IEC	IEC	Standard three-pin	Standard three-pin	IEC	Standard three-pin	IEC
UPS sockets	2	2	3	4	3	4	3	4
Surge-only sockets	1	1	1	4	1	0	1	2
Modem protection	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ethernet protection	No	No	No	No	Yes	No	Yes	Yes
Hot-swap batteries	No	No	No	Yes	No	No	No	Yes
Maintenance routines	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Cold start	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PC interface	None	None	USB Hi-Speed	USB Hi-Speed	Serial, USB Hi-Speed	Serial	Serial, USB Hi-Speed	USB Hi-Speed
Cables included	2x IEC	2x IEC	2x IEC, 1x USB data cable	1x USB data cable	1x USB data cable, 1x serial data cable, 1x RJ-11, 1x RJ-45	2x IEC, 1x serial data cable	1x USB data cable, 1x serial data cable, 1x RJ-11, 1x RJ-45	2x IEC, 1x USB data cable, 1x RJ-11, 1x RJ-45
Dimensions (HxWxD)	147x105x338mm	147x105x338mm	163x90x277mm	86x320x285mm	190x120x300mm	180x140x368mm	190x120x300mm	226x101x322mm
Weight	5.7kg	6.1kg	5.4kg	6.8kg	13.1kg	11.2kg	13.1kg	9.0kg
SOFTWARE FEATURES								
Software	WinPower 1.0	WinPower 1.0	PowerChute Personal Edition	PowerChute Personal Edition	Belkin Bulldog Plus	WinPower 1.0	Belkin Bulldog Plus	PowerChute Personal Edition
Windows shutdown	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Windows file save	No	No	Yes	Yes	Yes	Yes	Yes	Yes
BUYING INFORMATION								
Street price (inc VAT)	£30	£45	£55	£67	£88	£89	£105	£122
Warranty	Two years RTB	Two years RTB	Two years RTB	Three years RTB	Three years RTB	Two years RTB	Three years RTB	Two years RTB
Connected equipment warranty	£12,000	£12,000	£50,000	£50,000	£100,000	£120,000	£200,000	£75,000
Supplier	www.lambda-tek.com	www.lambda-tek.com	www.morecomputers.co.uk	www.kikatek.com	www.morecomputers.co.uk	www.lambda-tek.com	www.dabs.com	www.dabs.com
Details	www.trust.com	www.trust.com	www.apc.com	www.apc.com	www.belkin.com/uk	www.trust.com	www.belkin.com/uk	www.apc.com
Part code	PW-4060T	PW-4095T	BK350EI	BE-700-UK	F6C800UKUNV	PW-4120M	F6C120UKUNV	BR800I

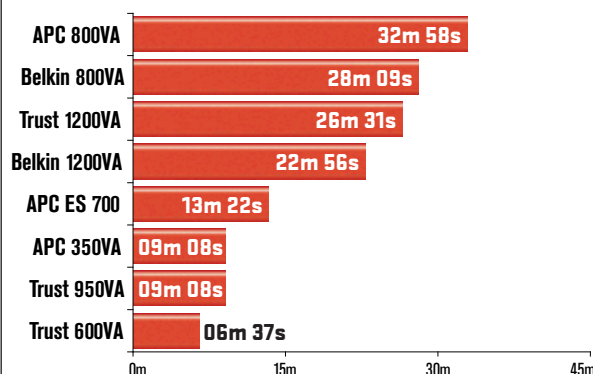
Performance UPS battery life

System idle



When idle, our test PC had no applications running, but the monitor was set to stay on at all times

System under load



For the load test the test PC was running our multiple-application benchmark, which taxes both the processor and the hard disk

How we test UPS devices

We tested each UPS in two scenarios: one with the PC sitting idle, and one with it running our taxing benchmarks. Our test PC was a 2.53GHz Pentium 4 computer with a single hard disk and 512MB of RAM running Windows Vista, connected to a 20in widescreen LCD display.

We charged each UPS for a minimum of 12 hours before each test, and disabled any power management features in the UPS software to ensure that the unit didn't shut down our test PC before the battery was completely flat. We also turned off Vista's power management features so that all the PC's components would stay on.

In our idle test, we left the PC displaying the Windows desktop, then unplugged the UPS from the mains. A utility running on the PC logged the time every second until the battery failed and the PC switched off. On rebooting, we examined this log file to see how long the battery had lasted. For the intensive test we repeated this procedure, but with the PC running our taxing multi-application benchmark until it failed.

Labs verdict UPS devices

All the UPS units in this test will keep your PC going long enough for you to save any work and shut down Windows properly. Your choice should depend on how much power your PC needs, and whether you need your PC to shut down automatically when the power fails.

Trust's 600VA UPS can't shut down your PC automatically, but its battery can power a mid-range PC for a fair amount of time. It's also incredibly cheap, so it's our Budget Buy. If you have a high-specification PC, we recommend Belkin's 1200VA Universal UPS. It has useful, if fiddly, software and can provide up to 670W of power.

For most people, though, we recommend APC's Back-UPS ES 700VA. This unit provides plenty of backup sockets, can power your computer's peripherals as well as the PC itself and comes with excellent and simple software. It's our Best Buy. **ES**

